REMARKS

Applicants acknowledge that the outstanding Office Action, dated August 3, 2009, has been made final. Accordingly, a Request for Continued Examination has been submitted herewith, and further consideration of this application, based on the foregoing amendment, and the remarks set forth hereinbelow, is respectfully requested.

Claims 12-15 and 22-28 have been rejected under 35 U.S.C. §103(a) as unpatentable over Rinn et al (U.S. Patent No. 6,045,096) in view of Jaenker (U.S. Patent No. 6,043,587). However, for the reasons set forth hereinafter, Applicants respectfully submit that all claims which remain of record in this application distinguish over the cited references, whether considered separately or in combination.

In particular, Applicants respectfully submit that:

1. Due to the manner of operation of the variable camber air foil in Rinn et al, a person skilled in the art would find no reason to combine Rinn et al with Jaenker; and

2. The incorporation of a piezoelectric actuator in accordance with the teaching of Jaenker would in no way contribute to the operation of the Rinn et al structure, and indeed would impair the operation of that structure.

The present invention is directed to a deformable aerodynamic profiled member, which comprises (and is bounded by) two "shells", on a pressure side and on a suction side of the profiled member. According to Claim 12, as amended, the deformable aerodynamic profiled member according to the invention has deforming means for varying the curvature of the profiled member by changing the length of at least one of the shells in a desired direction. In particular, Claim 12 further specifies that the deforming means comprises at least one d33 piezo actuator mounted on at least one of the shells. This at least one piezo actuator is arranged on the shell with an orientation such that a change of the length of the piezo actuator causes a change of length in the plane of the shell in the desired direction, and a corresponding deformation of the profile. Thus, as can be seen, for example, in Figure 1, three piezo actuators 7 are mounted on the upper shell 5 with their axes oriented such that their expansion in response to the application of a voltage occurs in the direction of the arrow A. Accordingly, a corresponding deformation of the shell occurs.

The latter features of the invention are recited in Claim 12 as amended, which includes the following elements:

> "deforming means for varying a curvature of said profiled member by changing length of at least one of said shells in a desired direction; wherein,

said deforming means comprising at least one d33 piezo actuator mounted on said at least one shell; and

said at least one piezo actuator is arranged on said at least one shell with an orientation such that a change of length of said at least one piezo actuator causes a change of length in a plane of said at least one shell in said desired direction, and a corresponding deformation of said profile, when said at least one actuator is acted upon by electricity."

The latter features are disclosed in the specification in at least paragraph 30, lines 6-10, and also in paragraphs 10 and 11 on page 3.

The primary Rinn et al patent, on the other hand, operates in a fundamentally different manner. That is, as can be seen in Figures 3 and 4, and noted in the Abstract of the Disclosure at lines 2-9, for example, a flexible skin which substantially encloses the air foil profile in Rinn et al is fixedly coupled to the trailing portion of the air foil, and is slidable over the structure of the remainder of the air foil. (See also, Column 3, lines 42-45, and Column 4, lines 27-29.) As discussed in the specification at Column 3, lines 46-65, a pivot bar 38 (Figures 2 and 5), which is not numbered in Figures 3 and 4, can be manipulated by an operator via an actuator rod 34 to move the trailing edge 46 of the airfoil assembly downward, as can be seen from a comparison of Figures 3 and 4. (See Column 3, lines 46-65; Column 4, lines 26-32.)

Downward movement of the tail section 46 causes the skin to slide over the support structure 22 in a clockwise direction as indicated by the arrows in Figure 3 (Column 4, lines 26-28), causing the support arms 48 to rotate clockwise about fixed pivot points on the support structure. As a result, as can be seen from a careful comparison of Figures 3 and 4, the upper portion of the air foil assembly is pushed outward relative to the support section 22, while the lower portion is pulled toward the support structure 22. Thus, the air foil "bulges" on its upper surface while its lower surface is retracted inwards. Such movements are, as noted, actuated by the downward movement of the trailing edge 46 of the air foil via the pivot bar 38, so that the skin of the air foil slides in the clockwise direction, as noted previously. (See, for example, Column 4, lines 27-37.)

As can be seen from the foregoing brief description, the variable camber air foil disclosed in Rinn et al differs both structurally and operationally from that of the present application. In particular, it does not include any "deforming means" such as recited in Claim 12 which are mounted on one of the shells in such a direction as to impart a deformation force which changes the length of the shell in a desired direction.

The Office Action notes in this regard that Jaenker teaches that d33 piezo actuators can be used to actuate a member. Accepting that proposition as correct for the purpose of discussion, Applicants note that due to the manner of operation of the Rinn et al air foil, the incorporation of piezo actuators to stretch

the skin 20 would provide no useful purpose, and indeed would impair the operation of the apparatus. That is, the deformation of the air foil in Rinn et al is achieved by a clockwise sliding of the skin 20 over the supporting structure illustrated in Figures 3 and 4, due to a downward movement of the trailing edge 46 of the air foil, to which the skin in fixedly coupled. It is apparent that such operation depends on the proposition that rather than stretching, the skin slides in the clockwise direction. Assuming that the application of a piezo actuator such as that of Jaenker et al would stretch the skin, the result would be simply to generate a slack; it would not cause any sliding movement of the skin, such as is necessary for the operation in Rinn et al. Indeed, after such stretching, upward and downward movement of the trailing edge 46 by the actuator rod 34 to effect a change of the camber of the air foil by rotation of the support arms 48 in the manner described previously would be impaired or precluded.

Accordingly, as noted previously, since the addition of a d33 piezo electric actuator such as disclosed in Jaenker would not contribute in any way to the operation of the structure in Rinn et al, a person skilled in the art would find no reason to combine the two. Moreover, for the reasons noted previously, were he to do so, such a piezo actuator would serve simply to degrade or frustrate altogether the operation of the variable camber air foil in Rinn et al. Accordingly, Applicants respectfully submit that the deformable aerodynamic

profiled member recited and defined in Claim 12 of the present application is not taught or suggested by the combined teachings of Rinn et al and Jaenker.

In light of the foregoing remarks, this application should be in consideration for allowance, and early passage of this case to issue is respectfully requested. If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #056226.56477US).

Respectfully submitted,

Gary R. Edwards
Registration No. 31,824

CROWELL & MORING LLP
Intellectual Property Group
P.O. Box 14300
Washington, DC 20044-4300
Telephone No.: (202) 624-2500
Facsimile No.: (202) 628-8844
GRE:kms
9660478_1.DOC